IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

APPELLANTS' BRIEF UNDER 37 C.F.R. § 41.37

In re the Application of:	**Harper et al.**
Application No.:	**10/797,646**
Filed:	**March 10, 2004**
Group Art Unit:	**2457**
Examiner:	**Rubin, Blake J.**
For:	**REDUCED DATA SESSION ESTABLISHMENT TIME IN CDMA-2000 NETWORKS**
Attorney Docket No.:	**111244.162**

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Table of Contents

I. REAL PARTY IN INTEREST

The real party in interest is Starent Networks LLC, the assignee of record.

II. RELATED APPEALS AND INTERFERENCES

There are no pending appeals or interferences that would directly or indirectly affect or have a bearing on the Board's decision in this appeal.

III. STATUS OF CLAIMS

Claims 2, 14 and 15 have been cancelled. The remaining claims in the application, claims 1, 3-13, and 16-23, have been rejected and are being appealed herein.

IV. STATUS OF AMENDMENTS

Claims 1, 3-13, and 16-23 were rejected in a final office action issued January 14, 2010. No amendments were filed after the final office action.

V. SUMMARY OF CLAIMED SUBJECT MATTER

The claims are generally directed to data session establishment and operation, e.g., in CDMA-2000 networks. Specification at 2:6-8 provides: "By preventing or minimizing the time lost in establishing a successful over the air configuration negotiation, service providers and subscribers will enjoy increased network performance." Claims 1, 8, 16 and 19 are independent. Claims 3-7 and 22-23 depend from claim 1. Claims 9-13 depend from claim 8. Claims 17-18 depend from claim 16. Claims 20-21 depend from claim 19.

Claim 1 is directed to a method for establishing a data communication session with a mobile subscriber in a wireless communication network. The limitations of claim 1 are listed below, with support from the specification indicated parenthetically (noting that the cited embodiments are intended simply to provide an illustrative example of the claimed subject matter):

- receiving a registration request at a packet data server to register a data communication session between the packet data server and the mobile subscriber prior to a radio air link being established with the mobile subscriber (Specification at 2:11-3:2; 6:22-7:6; and 10:4-15; Figs. 2-3)

- sending a reply signal from the packet data server to trigger the establishment of a radio air link between the base station and the mobile subscriber to allow communication between the packet data server and the mobile subscriber (Specification at 2:11-16; 6:22-7:6; 10:4-15; Figs. 2-3)

- waiting a time period after the registration request and the reply to allow establishment of the radio air link before sending a link configuration request to the mobile subscriber, wherein the link configuration request is used to set up a data link connection between the mobile subscriber and the packet data server (Specification at 2:11-16; 7:7-13; 9:17-12:7; Figs. 3-4)

- establishing a data communication session between the mobile subscriber and the packet data server using the data link connection (Specification at 2:11-16; 8:22-9:6; Fig. 2)

VI. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

A. Whether claims 1, 3, 6-11, 13, and 16-23 are rendered obvious under 35 U.S.C. § 103(a) by U.S. Patent No. 6,904,033 issued to Perras et al. (Perras), in view of U.S. Patent Application Publication No. 2003/0158959 disclosed by Jayapalan et al. (Jayapalan).

B. Whether claims 4, 5, and 12 are rendered obvious under 35 U.S.C. §103(a) by Perras in view of Jayapalan, and further in view of U.S. Patent No. 6,005,852 issued to Kokko et al. (Kokko).

VII. ARGUMENTS

Applicants appeal the Examiner's rejection of claims 1, 8, 16 and 19 and submit that these claims are patentable for the reasons set forth below in section VII.A. Claims 3, 6-7 and 22-23 stand or fall with claim 1. Claims 9-11 and 13 stand or fall with claim 8. Claims 17-18 stand or fall with claim 16. Claims 20-21 stand or fall with claim 19. Each of these claims is patentable for the same reasons set forth in section VII.A.

Claims 4, 5, and 12 are patentable for the same reasons set forth in section VII.A. Additionally and separately, claims 4, 5 and 12 are patentable for the reasons set forth below in section VII.B.

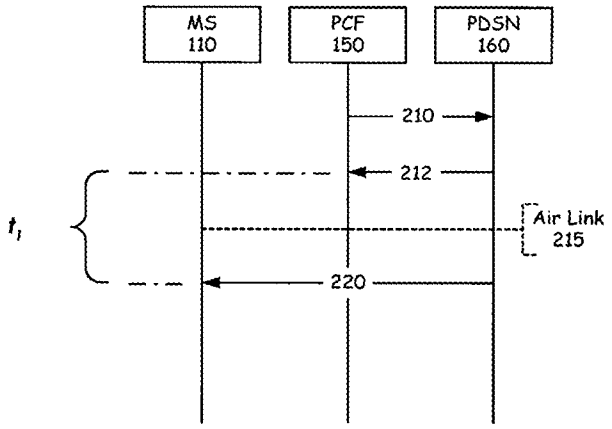
A. Claims 1, 3, 6-11, 13 and 16-23 are not rendered obvious by Perras combined with Jayapalan.

(1) Perras does not teach delaying Layer 3 session establishment to wait for a Layer 1 and Layer 2 physical layer link.

Independent Claim 1

Independent claim 1 of the present application is generally directed to "a method for establishing a data communication session with a mobile subscriber in a wireless communication network." Specifically, the application concerns establishment of Point-to-Point Protocol (PPP) sessions. Claim 1 requires "waiting a time period after the registration request and the reply to allow establishment of the radio air link before sending a link configuration request to the mobile subscriber…"

In the context of the Open Standards Interconnect (OSI) layered networking model, the radio air link corresponds to Layer 1, which is the physical radio medium, and also Layer 2, which are the protocols used to make the radio spectrum usable for data communications. Layer 3 constitutes a data communication session such as PPP. The present application teaches delaying Layer 3 session establishment to wait for a Layer 1 and Layer 2 physical layer link. (Abstract; *see* FIG. 3, below.) If there is an attempt to establish a session before the link, the attempt at establishing a Layer 3 session results in an undesirable configuration timeout. (Specification at 7:7-8:3). Delaying Layer 3 session establishment (*see* **220**, below) until after air link establishment (*see* **215**, below) eliminates such a configuration timeout.



The Examiner asserts that Claim 1 is rendered obvious by Perras in view of Jayapalan. Perras relates to techniques for reducing the harmful impact of a PPP connection timeout. Typically, a PPP client or server waits a certain time for acknowledging PPP session establishment messages. If there is no response from the remote client or server within a certain time, the session is dropped. However, the default PPP timer is typically set to over two hours, which is an undesirably long period for a Mobile IP node. The result is that mobile nodes are prevented from retrying session establishment for the duration of the timer, which can result in lengthy delays.

Perras mitigates this issue by "allowing MNs [mobile nodes] to re-attempt registrations with the PDSN [packet data serving node] …during a substantially short predefined period of time following an unsuccessful MIP [Mobile IP] registration" (Perras, col. 4 ll. 27-35). Specifically, Perras does this by setting a PPP timer to "a substantially short predetermined period of time, such as for example after two minutes" (Perras, col. 4 ll. 57-59).

The Examiner has erred in conflating the PPP timer of Perras with the wait time period of the present application. The PPP timer of Perras does not impact the establishment of an underlying radio air link. In fact, it does not describe any steps that take place prior to PPP connection establishment. Instead, Perras states that as a prerequisite, "first, in step **20**, a Point-to-Point Protocol (PPP) connection is established" (Perras, col. 3 lines 33-34). This indicates that Perras focuses on events that occur only after a Layer 3 connection is established (*see, e.g.* Perras, FIG. 2, **50**, below).

In Perras, FIG. 2, reproduced below, it is clear that PPP timer **41** does not appear prior to PPP connection establishment **20**. PPP timer **41** also does not appear prior to the establishment of radio link **37**.

Table 1

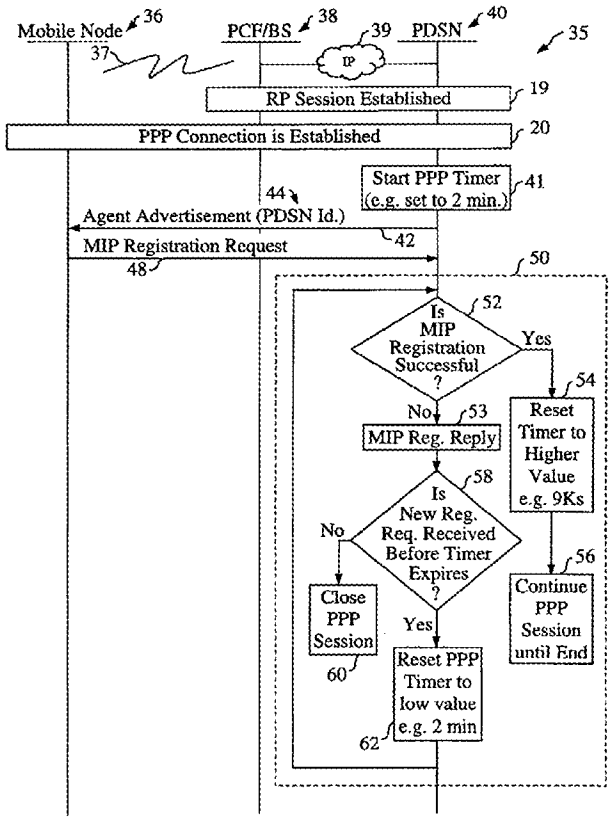


Figure 2

Perras thus explicitly assumes the existence of a Layer 1 and Layer 2 link. This is significantly different from the claims in the present application that teach delaying Layer 3 session establishment to wait for a Layer 1 and Layer 2 physical layer link. If the link exists, there is no need to delay Layer 3 session establishment, and the problem which the present application attempts to solve does not exist. (*See* Specification *at* 7:14-8:21.)

Perras thus does not provide "waiting a time period…to allow establishment of the radio air link." (Claim 1.) As well, none of the other cited references provide this element.

This argument was made to the Examiner in Applicant's response to the Office Action of April 29, 2009. However, in his final rejection, the Examiner responded to this argument by

saying that "negotiation prior to any radio link communication taking place…is impossible if the connecting party wishes to communicate strictly via a wireless connection." (Final Office Action of Jan. 14, 2010, p. 13, ll. 3-5).

The Examiner has erred by not understanding the difference between setting up a Layer 1 and Layer 2 radio air link with the mobile node, and setting up a Layer 3 PPP session with the packet data server. Both communications are possible, because they occur on different links. Referring to FIG. 3 of the application, reproduced above, the establishment of the radio air link **215** occurs over the wireless link from the mobile node **110** to the packet control function **150** (or other node connected directly to the wireless device), while the PPP session occurs over the wired link between the packet data server **160** and the packet control function.

Independent claim 8

Independent claim 8 additionally requires "sending a signal from the packet data server to trigger the establishment of a radio air link between the base station and the mobile subscriber to allow communication between the packet data server and the mobile subscriber." Perras fails to show or suggest this limitation because Perras does not describe any steps prior to the PPP connection established at **20** (Perras, col. 3, l. 33; col. 4, ll. 50-54). Even if the Examiner considered the airwaves or radio air interface **37** to be the radio air link, Perras fails to mention what triggers the establishment of the radio air interface (*see* Perras, col. 4, ll. 36-49).

Even if the Examiner used the radio air interface **37** of Perras to show the radio air link of claim 15, Perras still fails to disclose "a signal indicating that a radio air link has been successfully established" because Perras does not describe how the radio air interface **37** is established (*see id.)*.

Independent claims 16 and 19

Independent claims 16 and 19 require (italics added):

- delaying transmission of a *configuration request signal for a Point-to-Point Protocol (PPP) connection setup* from the data packet server module to the mobile subscriber (Claim 16);

- sending the *configuration request signal* to the mobile subscriber after a triggering event (Claim 16);

- said packet data server including a processor that triggers the establishment of the radio air link and attempts sending a *link configuration request* signal over said communication network responsive to an indication that said radio air link is ready to carry said *link configuration request* signal to said mobile subscriber *to establish a first Point-to-Point Protocol (PPP) connection* (Claim 19).

For at least the same reasons mentioned above, Perras fails to show or suggest "delaying transmission of a configuration request signal for a Point-to-Point Protocol (PPP) connection setup" as claim 16 requires. Perras is silent about any communications between mobile node **36** and PDSN **40** before Perras' PPP link 20 is established (Perras, FIG. 2, above). There is no "configuration request signal" to set up a PPP connection in Perras, and Perras discloses a PPP timer 41 after the establishment of a PPP connection. This is in contrast to claim 16 which requires "waiting to transmit a configuration request signal" for a PPP connection setup.

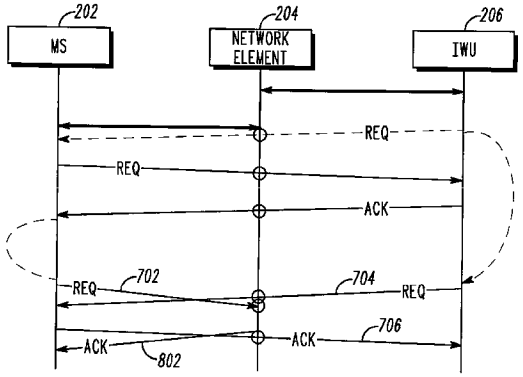
As well, since there is no configuration request signal, Perras cannot show or suggest "sending the configuration request signal to the mobile subscriber after a triggering event."

Further, since the first PPP connection has already been established in Perras, "an indication that said radio air link is ready to carry said link configuration request signal" cannot be sent to the packet data server.

(2) Jayapalan does not provide that which is missing from Perras.

Independent Claim 1

The Examiner admits that Perras does not disclose waiting a set time period, but argues that this feature is taught by Jayapalan. Jayapalan is directed to the use of an intermediary network element to monitor PPP session establishment. Jayapalan FIG. 8 is reproduced below.



While monitoring the establishment of a PPP connection, network element **204** determines if a data message is detected from a first peer **206** before a control message is detected. This indicates that a previous control message was lost (represented above as a dotted line with the label "REQ"). The network element then refrains from forwarding the data message from the first peer for a configurable predetermined wait time.

During the wait time, Jayapalan addresses the problem of "duplicate negotiations when establishing PPP communications" (Jayapalan, ¶ 5). This is accomplished by the network element intervening to suppress duplicate requests and to send acknowledgement messages to a peer when a duplicate request is made by the peer. During this wait time, if there are duplicate session establishment negotiations, the network element "discards the retransmitted request, thereby preventing it from getting to its intended destination, and it may…send an acknowledgement back to the sender of the retransmitted configuration request" (Jayapalan, ¶ 27).

As shown above, the wait time shown and described in Jayapalan essentially describes a buffer. Data messages are prevented from being sent from a first peer to a second peer until a PPP session has been established, and then are sent when the session has been established. This is merely a necessary and ordinary wait time before the data messages in the buffer can be sent out over the PPP connection. As well, the packets in question are packets at the same OSI layer. This is indicated by the fact that the data packets that are caused to wait are "data destined for the PPP layer in a peer" (Jayapalan, ¶ 24).

The wait time shown and described in Jayapalan is therefore much different from a wait time to allow establishment of a radio air link. Jayapalan, ¶ 24, states that "the network element

starts monitoring after the physical links…have been established." Jayapalan thus also explicitly assumes the existence of a Layer 1 and Layer 2 link; this assumption is similar to what is shown above in Perras. As is stated above in Section VII.A, if the link exists, there is no need to delay Layer 3 session establishment, and the problem which the present application attempts to solve does not exist. (*See* Specification *at* 7:14-8:21.)

Jayapalan FIG. 6, reproduced below, shows that this wait time **604** is the only wait time specifically referenced by Jayapalan. Although Jayapalan also references wait times performed by PPP timeout timers, these timers are well-known to one having ordinary skill in the art and are presumably not being referred to by the Examiner.

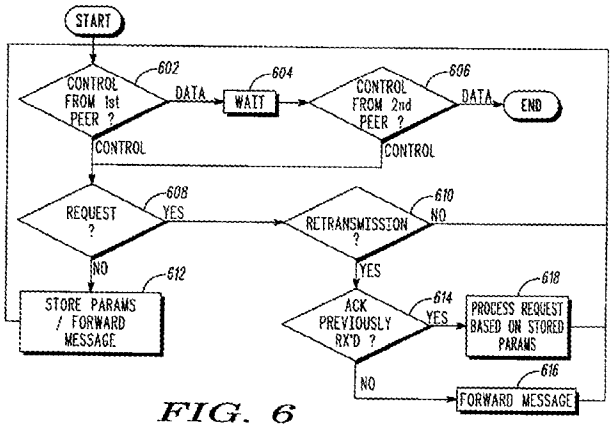


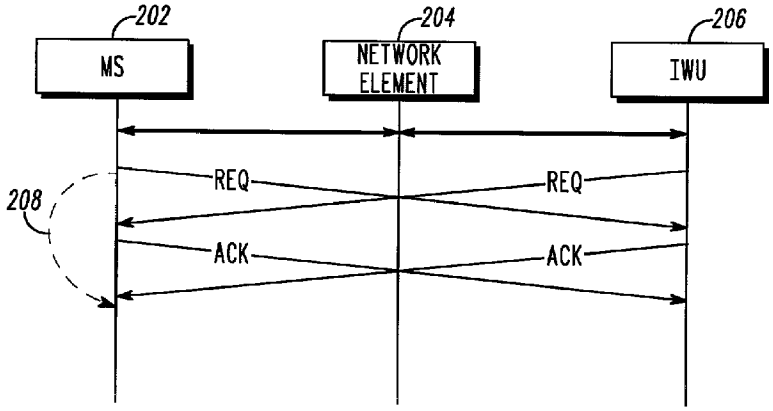
FIG. 6

Independent Claim 8

With regards to Claim 8, Applicant has previously pointed out that the combination of Perras and Jayapalan fails to disclose "sending an initial link configuration signal for the mobile subscriber from the packet data server." (Response to Non-Final Office Action of Apr. 29, 2009, p. 7, ll. 6-12.) The Examiner asserts that the combination of Perras and Jayapalan discloses this, and to support this, the Examiner uses Jayapalan, ¶ 4, ll. 12-15, which discloses "the trigger of a wireless connection between two devices as a configuration request message." (Final Office Action of Jan. 14, 2010, p. 13, ll. 7-14.)

The Examiner analogizes the PPP session establishment request message of Jayapalan to the trigger disclosed in claim 8. However, the Examiner's reasoning is flawed. Jayapalan, ¶ 4 refers to the basic use of request (REQ) and acknowledgement (ACK) messages to establish a connection between sender and receiver, which is well-known in the art. In contrast, the trigger

of Claim 8 is sent from a packet data server to a base station, not from the PDSN to the mobile node directly as is the case for the request message in Jayapalan, FIG. 2 (below). No special-purpose trigger messages are received by the base station in Jayapalan. Messages are instead either suppressed or relayed directly to the mobile node in Jayapalan, which is an impossibility in the present application since the radio air link has not yet been established.



Additionally, in Claims 16 and 19, the waiting is performed to allow an air link to be set up before a configuration message is sent. Even if Perras could be modified with the teaching of Jayapalan, it would not provide the teaching of the claim because in Jayapalan, the wait time is a buffer for resending data messages, not configuration messages.

With regard to the fact that Perras does not supply any steps that take place prior to Layer 3 PPP session establishment, Jayapalan also does not provide what is missing in Perras. Jayapalan, ¶ 4 states, "In an ideal scenario, a communication link between the communication unit and network element, as well as a communication link between the IWU and network element are established *substantially simultaneously* as shown by the heavy arrows in FIG. 2" (italics added; *see* FIG. 2, above). This statement further highlights a difference between Jayapalan and the present application, in which the links are not assumed to be established. In Jayapalan, such a link has already been established. The existence of a network element that inspects packets is in itself evidence that a Layer 3 network transport mechanism for packets exists. Therefore, Jayapalan does not provide delaying Layer 3 session establishment to wait for a Layer 1 and Layer 2 physical layer link.

(3) It would not have been obvious to combine Perras and Jayapalan.

Even if the waiting in Jayapalan supplies what is missing from Perras, it would not have been obvious to one of ordinary skill in the art to modify Perras with the waiting a set time period taught by Jayapalan. Such a combination would change the principle of operation of Perras (*see* MPEP §2143.01(VI)). As is mentioned above under (1), Perras sets a PPP timer to "a substantially short predetermined period of time, such as for example after two minutes" (Perras, col. 4 ll. 57-59). The goal of Perras is to cause the PPP session to time out earlier than normal by using the shortened PPP timer. Perras does this to reduce the delay caused by PPP connection keep-alive in case of Mobile IP negotiation failure. This is clearly the opposite of adding a wait period or delay. Combining the wait period of Jayapalan with Perras would change the principle of operation of Perras at best, and render it inoperable at worst.

Further, the Examiner cites Jayapalan, ¶ 5, "solving the problem of reducing multiple negotiations to improve the quality of communication," as motivation to combine the references. Perras does not reduce multiple negotiations; instead, it facilitates multiple connection attempts within a shorter time by reducing the time required for the PPP timeout timer. Neither does the present application reduce multiple negotiations; instead, it delays a single negotiation of the Layer 3 session to wait for a Layer 1 and Layer 2 physical layer link. There is no reason why one of ordinary skill in the art would combine the two references.

Accordingly, it would not have been obvious to combine Perras and Jayapalan, and even if they were so combined, the result would not have all the limitations of claim 1.

For these reasons, applicants submit that Claims 1, 8, 16 and 19 are patentable over Perras in view of Jayapalan. Claims 3, 6-7, and 22-23, which depend from claim 1, Claims 9-11 and 13, which depend from Claim 8, Claims 17-18, which depend from Claim 16, and Claims 20-21, which depend from Claim 19, are also patentable for at least the same reasons.

B. Even if Claims 1, 3, 6-11, 13 and 16-23 are rendered obvious by Perras combined with Jayapalan, Claims 4, 5 and 12 are not rendered obvious by Perras combined with Jayapalan and Kokko because Kokko does not teach a wait period.

Claims 4 and 5 of the present application depend from Claim 1. Claim 12 of the present application depends from Claim 8. Claims 4 and 5 are directed to waiting a fixed wait time

period having a specified duration of between 10 milliseconds and 1 second, and approximately 100 milliseconds, respectively. Claim 12 is directed to waiting a first time period having a duration between 10 milliseconds and 1 second.

The Examiner asserts that claims 4, 5 and 12 are rendered obvious by Perras in view of Jayapalan and Kokko. Kokko discloses methods for allocating resources and controlling the load of packet mode connections in a Direct Sequence Code Division Multiple Access (DS-CDMA) cellular communication system (*see* Kokko, col. 1, ll.11-14 and col. 2, ll. 1-18). The Examiner admits that neither Perras nor Jayapalan disclose waiting a time period of between 10 milliseconds and 1 second, and neither discloses waiting a time period of approximately 100 milliseconds. However, the Examiner argues that Kokko teaches both of these limitations.

The Examiner cites Kokko to provide a wait period, but the Examiner incorrectly characterizes the specified time period in Kokko as a wait period, when in fact it is a maximum delay period. The Examiner cites Kokko, col. 8, ll. 49-56, and Kokko, col. 9, ll. 5-13 to support his argument, and the cited lines do provide determining "whether a packet has been in the buffer **12A** for more than some predetermined period of time (e.g. 100 ms)." (Kokko, col. 9, ll. 9-11.) However, this is not a period created by intentional waiting. Rather, the specified time is a maximum packet delay time in an egress buffer maintained by a mobile node or cellular phone. During ordinary processing of data, the mobile node outputs data to the egress buffer, and attempts to transmit the data as rapidly as possible; in fact, Kokko indicates that one of its benefits is that "the average delay in transmitting a packet, from the time of receipt, can be reduced" (Kokko, col. 8, ll. 49-51). The delay time is only produced when resources are not available to transmit the packets in the egress buffer.

Kokko provides several scenarios where the packets in the buffer are transmitted without delay. Firstly, if "the MS 12 determines whether it has more than some number (e.g. three) packets in its buffer…the MS 12 sends a request for packet transmission (i.e., a reservation request)" (Kokko, col. 9, ll. 8-13). Secondly, "if new data arrives and is stored as one or more new packets in the buffer 12A, while transmission is on-going, these newly arrived packets may also be transmitted" (Kokko, col. 8, ll. 18-21). This indicates that the ideal time for a packet in

the buffer is zero, and that the specified time period in Kokko is a maximum delay period. Consequently, Kokko does not teach a wait time period.

VIII. CONCLUSION

For the reasons set forth above, Appellants request that the Board reverse the outstanding rejections, remand the application to the Examiner, and direct the Examiner to issue a Notice of Allowance.

Respectfully submitted,

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IX. CLAIMS APPENDIX

Pending Claims

1. A method for establishing a data communication session with a mobile subscriber in a wireless communication network, comprising:

receiving a registration request at a packet data server to register a data communication session between the packet data server and the mobile subscriber prior to a radio air link being established with the mobile subscriber;

sending a reply signal from the packet data server to trigger the establishment of a radio air link between the base station and the mobile subscriber to allow communication between the packet data server and the mobile subscriber;

waiting a time period after the registration request and the reply to allow establishment of the radio air link before sending a link configuration request to the mobile subscriber, wherein the link configuration request is used to set up a data link connection between the mobile subscriber and the packet data server; and

establishing a data communication session between the mobile subscriber and the packet data server using the data link connection.

2. (Cancelled)

3. The method of claim 1, further comprising calculating a dynamic duration for the set time period based on network conditions.

4. The method of claim 1, wherein waiting the time period comprises providing a fixed wait time period having a duration between 10 milliseconds and 1 second.

5. The method of claim 1, wherein waiting the time period comprises providing a fixed wait time period having a duration of approximately 100 milliseconds.

6. The method of claim 1, wherein registering the data session comprises registering the data session according to an A11 protocol compatible with a Point-to-Point Protocol (PPP) communication network.

7. The method of claim 1, wherein sending the link configuration request signal comprises sending a Point-to-Point Protocol (PPP) based signal.

8. A method for communicating with a mobile subscriber in a wireless communication network, comprising:

receiving a request at a packet data server to register a data session between a mobile subscriber and the packet data server prior to a radio air link being established with the mobile subscriber;

sending a signal from the packet data server to trigger the establishment of a radio air link between the base station and the mobile subscriber to allow communication between the packet data server and the mobile subscriber;

sending an initial link configuration signal for the mobile subscriber from the packet data server, wherein a link configuration signal is used to establish a data link connection between the mobile subscriber and the packet data server; and

waiting a first set time period from sending the initial link configuration request signal for the mobile subscriber before sending a second initial link configuration request signal, wherein the first set time period provides additional time for establishment of the radio air link.

9. The method of claim 8, further comprising providing a second wait time period triggered by a data communication error event before sending a link configuration request signal to the mobile subscriber.

10. The method of claim 8, further comprising repeatedly waiting a time equal to the first wait time period until an air link to the mobile subscriber is successfully established.

11. The method of claim 9, wherein the link configuration signal is a Point-to-Point Protocol (PPP) based communication protocol which upon configuration establishes a PPP connection between the mobile subscriber and the packet data server.

12. The method of claim 8, wherein waiting the first set time period comprises waiting a first time period having a duration between 10 milliseconds and 1 second.

13. The method of claim 8, wherein the radio air link allows the establishment of a data communication session.

14-15. (Cancelled).

16. A method for establishing a data communication session with a mobile subscriber in a wireless communication network, the method comprising:

delaying transmission of a configuration request signal for a Point-to-Point Protocol (PPP) connection setup from the data packet server module to the mobile subscriber after receiving a registration request at the data packet server;

sending the configuration request signal to the mobile subscriber after a triggering event, wherein the triggering event indicates that an air link is established with the mobile subscriber; and

establishing a PPP connection between the mobile subscriber and the packet data server and providing the data communication session over the PPP connection.

17. The method of claim 16, wherein the triggering event is a time-based trigger signal.

18. The method of claim 16, further comprising sending a signal from the packet data server to trigger the establishment of a radio air link between the base station and the mobile subscriber to allow communication between the packet data server and the mobile subscriber.

19. A system for wireless communication, comprising:

a packet data server;

a communication network adapted for carrying control and data packets between a mobile subscriber and the packet data server;

a radio air link portion of said communication network, the radio air link having associated therewith an air link establishment delay time; and

said packet data server including a processor that triggers the establishment of the radio air link and attempts sending a link configuration request signal over said communication network responsive to an indication that said radio air link is ready to carry said link configuration request signal to said mobile subscriber to establish a first Point-to-Point Protocol (PPP) connection.

20. The system of claim 19, wherein the indication comprises a time-based signal indicating that a wait time exceeding the air link establishment delay time has elapsed.

21. The system of claim 19, wherein the indication comprises an event-based signal indicating that the air link has been successfully established to the mobile subscriber.

22. The method of claim 1, further comprising buffering data packets prior to the successful establishment of a radio air link to the mobile subscriber.

23. The method of claim 1, wherein the time period is determined from the packet data server pinging a node and determining a network propagation time.

X. EVIDENCE APPENDIX

U.S. Patent No. 6,904,033 (issued Jun. 7, 2005)

U.S. Patent Application Publication No. 2003/0158959 (published Aug. 21, 2003)

U.S. Patent No. 6,005,852 (issued Dec. 21, 1999)

XI. RELATED PROCEEDINGS APPENDIX

None